AMENDMENTS TO THE CLAIMS

Claims 1-93 (Cancelled)

94. (Currently Amended) A method of treating a human joint disease involving cartilage comprising:

obtaining electronic image data of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image data to obtain information about geometry of the joint, said electronically evaluating including evaluating the joint along one or more vectors tangent or perpendicular to the cartilage or bone surface ~~at least two non-parallel planes~~; and

selecting a therapy based on said three-dimensional evaluation.

95. (Previously Presented) The method of claim 94, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional representation of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the initial time,

obtaining a three-dimensional representation of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

96. (Previously Presented) The method of claim 94, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

97. (Previously Presented) The method of claim 94, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D form D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

98. (Previously Presented) The method of claim 94, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

99. (Previously Presented) The method of claim 94, wherein said electronically evaluating further comprises:

providing a biochemically based representation of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

evaluating the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

100. (Previously Presented) The method of claim 94, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

101. (Previously Presented) The method of claim 94, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelctrical image data for the

assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

102. (Previously Presented) The method of claim 94, wherein said electronic image data provides information on the thickness, shape, or curvature of said normal and said diseased tissue or the location and size of said diseased tissue.

103. (Currently Amended) The method of claim 94, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, an implant, a replacement material, a scaffold, a regenerating material, ~~and~~ a repair system, tibial corticotomy, femoral osteotomy or tibial osteotomy.

104. (Previously Presented) The method of claim 94, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent.

105. (Previously Presented) The method of claim 94, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

106. (Previously Presented) The method of claim 94, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

107. (Previously Presented) The method of claim 106, wherein said information is used to generate a three-dimensional representation of cartilage thickness or a physical model of said normal or said diseased tissue or both.

108. (Previously Presented) The method of claim 107, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

Claims 109-168 (Cancelled)

169. (Currently Amended) A method of treating a human joint disease involving cartilage comprising:

obtaining electronic image data of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image data to obtain information about geometry of the joint, said electronically evaluating including evaluating the joint along one or more vectors tangent or perpendicular to the cartilage or bone surface; and

determining at least one of size and ~~a~~ shape for at least one of a transplant, a graft, an implant, a replacement material, a scaffold, a regenerating material and a repair system based on said three dimensional evaluation.

170. (Previously Presented) The method of claim 169, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional representation of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the initial time,

obtaining a three-dimensional representation of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

171. (Previously Presented) The method of claim 169, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

172. (Previously Presented) The method of claim 169, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D form D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

173. (Previously Presented) The method of claim 169, wherein said electronically evaluating

further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

174. (Previously Presented) The method of claim 169, wherein said electronically evaluating further comprises:

providing a biochemically based representation of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

evaluating the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

175. (Previously Presented) The method of claim 169, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

identifying the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

176. (Previously Presented) The method of claim 169, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelctrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

177. (Previously Presented) The method of claim 169, wherein said electronic image provides information on the thickness, shape, or curvature of said normal and said diseased tissue or the location and size of said diseased tissue.

178. (Previously Presented) The method of claim 169, wherein said articular repair comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting,

tibial corticotomy, femoral or tibial osteotomy.

179. (Previously Presented) The method of claim 169, wherein said articular repair uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent.

180. (Previously Presented) The method of claim 169, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

181. (Previously Presented) The method of claim 169, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

182. (Previously Presented) The method of claim 181, wherein said information is used to generate a three-dimensional representation of cartilage thickness or a physical model of said normal or said diseased tissue or both.

183. (Previously Presented) The method of claim 182, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

184. (Currently Amended) A method of treating a human joint disease involving cartilage comprising:

obtaining electronic image data of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image data to obtain information about geometry of the joint, said electronically evaluating including evaluating said joint along one or

more vectors tangent or perpendicular to the cartilage or bone surface ~~at least two non-parallel planes~~; and

designing a therapy based on said three dimensional evaluation.

185. (Previously Presented) The method of claim 184, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional representation of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the initial time,

obtaining a three-dimensional representation of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

186. (Previously Presented) The method of claim 184, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

187. (Previously Presented) The method of claim 184, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a

joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D form D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

188. (Previously Presented) The method of claim 184, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

189. (Previously Presented) The method of claim 184, wherein said electronically evaluating further comprises:

providing a biochemically based representation of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

evaluating the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having

altered amounts of the biochemical component present.

190. (Previously Presented) The method of claim 184, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

identifying the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

191. (Previously Presented) The method of claim 184, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelctrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage

and bone data and the opto-electrical data.

192. (Previously Presented) The method of claim 184, wherein said electronic data provides information on the thickness, shape, or curvature of said normal and said diseased tissue or the location and size of said diseased tissue.

193. (Previously Presented) The method of claim 184, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, an implant, a replacement material, a scaffold, a regenerating material and a repair system, tibial corticotomy, femoral or tibial osteotomy.

194. (Previously Presented) The method of claim 184, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent.

195. (Previously Presented) The method of claim 184, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

196. (Previously Presented) The method of claim 184, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

197. (Previously Presented) The method of claim 196, wherein said information is used to generate a three-dimensional representation of cartilage thickness or a physical model of said normal or said diseased tissue or both.

198. (Previously Presented) The method of claim 197, wherein said physical model is used to

shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

199. (Currently Amended) A method of treating a human joint disease involving cartilage comprising:

obtaining electronic image data of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image data to obtain information about volume, area, thickness, curvature, water content, sodium content, hyaluronic acid content, glycosaminoglycan content, signal intensity or relaxation time of said normal or diseased tissue, or three dimensional geometry of the joint, said electronically evaluating including evaluating said image data along one or more vectors tangent or perpendicular to the cartilage or bone surface surface ~~at least two non-parallel planes~~; and

selecting or designing a therapy based on said three dimensional evaluation.

200. (Previously Presented) A method of treating a human joint disease involving cartilage comprising:

obtaining electronic image data of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image data to obtain information about geometry of the joint, said electronically evaluating further including:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional representation of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the initial time,

obtaining a three-dimensional representation of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times; and

selecting a therapy based on said three-dimensional evaluation.

201. (Previously Presented) A method of treating a human joint disease involving cartilage comprising:

obtaining electronic image data of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image data to obtain information about geometry of the joint, said electronically evaluating further including:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D form D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss; and

selecting a therapy based on said three-dimensional evaluation.

202. (Previously Presented) A method of treating a human joint disease involving cartilage comprising:

obtaining electronic image data of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image data to obtain information about geometry of the joint, said electronically evaluating further including:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times; and

selecting a therapy based on said three-dimensional evaluation.

203. (Previously Presented) A method of treating a human joint disease involving cartilage comprising:

obtaining electronic image data of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image data to obtain information about geometry of the joint, said electronically evaluating further including:

providing a biochemically based representation of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component in the cartilage,

determining the relative amounts of the biochemical component in the cartilage,

evaluating the amounts of the biochemical component in three dimensions in the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present; and

selecting a therapy based on said three-dimensional evaluation.

204. (Previously Presented) A method of treating a human joint disease involving cartilage comprising:

obtaining electronic image data of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image data to obtain information about geometry of the joint, said electronically evaluating further including:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2; and

selecting a therapy based on said three-dimensional evaluation.

205. (Previously Presented) A method of treating a human joint disease involving cartilage comprising:

obtaining electronic image data of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image to obtain information about geometry of the joint, said electronically evaluating further including:

correlating cartilage image data, bone image data, and optoelctrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in

(a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data; and

selecting a therapy based on said three-dimensional evaluation.

206. (Currently Amended) A method of treating a human joint disease involving cartilage comprising:

obtaining electronic data associated with an image of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image data to obtain information about geometry of the joint, said electronically evaluating including evaluating cartilage or bone in said image along at least three ~~plurality of~~ vectors, at least one of the vectors being non-coplanar and non-parallel with at least two of the other vectors defining a vector plane; and

selecting or designing a therapy based on said three-dimensional evaluation.

207. (Previously Presented) The method of claim 206, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional representation of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the initial time,

obtaining a three-dimensional representation of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

208. (Previously Presented) The method of claim 206, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

209. (Previously Presented) The method of claim 206, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D form D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

210. (Previously Presented) The method of claim 206, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

211. (Previously Presented) The method of claim 206, wherein said electronically evaluating

further comprises:

providing a biochemically based representation of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component in the cartilage,

determining the relative amounts of the biochemical component in the cartilage,

evaluating the amounts of the biochemical component in three dimensions in the cartilage, and

determining the areas of abnormal joint cartilage by identifying the areas having altered amounts of the biochemical component present.

212. (Previously Presented) The method of claim 206, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

213. (Previously Presented) The method of claim 206, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelctrical image data for the

assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

214. (Previously Presented) The method of claim 206, wherein said electronic image provides information on the thickness, shape, or curvature of said normal and said diseased tissue or the location and size of said diseased tissue.

215. (Previously Presented) The method of claim 206, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, an implant, a replacement material, a scaffold, a regenerating material and a repair system, tibial corticotomy, femoral or tibial osteotomy.

216. (Previously Presented) The method of claim 206, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent.

217. (Previously Presented) The method of claim 206, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

218. (Previously Presented) The method of claim 206, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

219. (Previously Presented) The method of claim 218, wherein said information is used to generate a three-dimensional representation of cartilage thickness or a physical model of said normal or said diseased tissue or both.

220. (Previously Presented) The method of claim 219, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

221. (Currently Amended) A method of treating a human joint disease involving cartilage comprising:

obtaining electronic image data of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions cartilage or bone in said image data to obtain information about geometry of the joint at a first point and a second point, wherein information related to the first point is derived based on at least one point of the joint that forms, with the first point, a first vector, wherein information related to the second point is derived based on at least one point of the joint that forms, with the second point, a second vector, and wherein the first and second vectors are non-coplanar and non-parallel; and

selecting or designing a therapy based on said three-dimensional evaluation.

222. (Previously Presented) The method of claim 221, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional representation of the cartilage at an initial time and

calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the initial time,

obtaining a three-dimensional representation of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

223. (Previously Presented) The method of claim 221, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

224. (Previously Presented) The method of claim 221, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D form D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

225. (Previously Presented) The method of claim 221, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

226. (Previously Presented) The method of claim 221, wherein said electronically evaluating further comprises:

providing a biochemically based representation of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

evaluating the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

227. (Previously Presented) The method of claim 221, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the

volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

228. (Previously Presented) The method of claim 221, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelctrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

229. (Previously Presented) The method of claim 221, wherein said electronic image data provides information on the thickness, shape, or curvature of said normal and said diseased tissue or the location and size of said diseased tissue.

230. (Previously Presented) The method of claim 221, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, an implant, a replacement material, a scaffold, a regenerating material and a repair system, tibial

corticotomy, femoral or tibial osteotomy.

231. (Previously Presented) The method of claim 221, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent.

232. (Previously Presented) The method of claim 221, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

233. (Previously Presented) The method of claim 221, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

234. (Previously Presented) The method of claim 233, wherein said information is used to generate a three-dimensional representation of cartilage thickness or a physical model of said normal or said diseased tissue or both.

235. (Previously Presented) The method of claim 234, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

236. (Currently Amended) A method of treating a human joint disease involving cartilage comprising:

imaging a joint on an imaging plane to obtain electronic image data, the image data including both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image data to obtain information about geometry of the joint, said electronically evaluating including evaluating cartilage or bone in

said image along a vector that is ~~not~~ non-parallel to the imaging plane; and

selecting or designing a therapy based on said three-dimensional evaluation.

237. (Previously Presented) The method of claim 236, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional representation of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the initial time,

obtaining a three-dimensional representation of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

238. (Previously Presented) The method of claim 236, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

239. (Previously Presented) The method of claim 236, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D form D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

240. (Previously Presented) The method of claim 236, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

241. (Previously Presented) The method of claim 236, wherein said electronically evaluating further comprises:

providing a biochemically based representation of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

evaluating the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

242. (Previously Presented) The method of claim 236, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

243. (Previously Presented) The method of claim 236, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelctrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

244. (Previously Presented) The method of claim 236, wherein said electronic image data provides information on the thickness, shape, or curvature of said normal and said diseased tissue or the location and size of said diseased tissue.

245. (Previously Presented) The method of claim 236, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, an implant, a replacement material, a scaffold, a regenerating material, a repair system, tibial corticotomy, femoral osteotomy or tibial osteotomy.

246. (Previously Presented)The method of claim 236, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent.

247. (Previously Presented) The method of claim 236, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

248. (Previously Presented) The method of claim 236, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

249. (Previously Presented) The method of claim 248, wherein said information is used to generate a three-dimensional representation of cartilage thickness or a physical model of said normal or said diseased tissue or both.

250. (Previously Presented) The method of claim 249, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue

scaffold or a tissue regenerating material or tissue repair system.

251. (New) A method of treating a human joint disease involving cartilage comprising:

obtaining CT or MRI image data of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image data to obtain information about geometry of the joint, said electronically evaluating including evaluating the joint along at least two non-parallel planes ; and

selecting a therapy based on said three-dimensional evaluation.

252. (New) The method of claim 251, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional representation of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the initial time,

obtaining a three-dimensional representation of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

253. (New) The method of claim 251, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

254. (New) The method of claim 251, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D form D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

255. (New) The method of claim 251, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

256. (New) The method of claim 251, wherein said electronically evaluating further comprises:

providing a biochemically based representation of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

evaluating the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

257. (New) The method of claim 251, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

258. (New) The method of claim 251, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelctrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

259. (New) The method of claim 251, wherein said electronic image data provides information on the thickness, shape, or curvature of said normal and said diseased tissue or the location and size of said diseased tissue.

260. (New) The method of claim 251, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, an implant, a replacement material, a scaffold, a regenerating material, a repair system, tibial corticotomy, femoral osteotomy or tibial osteotomy.

261. (New) The method of claim 251, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent.

262. (New) The method of claim 251, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

263. (New) The method of claim 251, wherein said information is used to generate a three-dimensional representation of cartilage thickness or a physical model of said normal or said diseased tissue or both.

264. (New) The method of claim 263, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

265. (New) A method of treating a human joint disease involving cartilage comprising:

obtaining CT or MRI image data of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image data to obtain information about geometry of the joint, said electronically evaluating including evaluating said joint along at least two non-parallel planes; and

determining at least one of size and shape for at least one of a transplant, a graft, an implant, a replacement material, a scaffold, a regenerating material and a repair system based on said three dimensional evaluation.

266. (New) The method of claim 265, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional representation of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the initial time,

obtaining a three-dimensional representation of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

267. (New) The method of claim 265, wherein said electronically evaluating further

comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

268. (New) The method of claim 265, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D form D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

269. (New) The method of claim 265, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

270. (New) The method of claim 265, wherein said electronically evaluating further comprises:

providing a biochemically based representation of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

evaluating the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

271. (New) The method of claim 265, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

identifying the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

272. (New) The method of claim 265, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelctrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

273. (New) The method of claim 265, wherein said electronic image provides information on the thickness, shape, or curvature of said normal and said diseased tissue or the location and size of said diseased tissue.

274. (New) The method of claim 265, wherein said articular repair comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, tibial corticotomy, femoral or tibial osteotomy.

275. (New) The method of claim 265, wherein said articular repair uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent.

276. (New) The method of claim 265, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair

system.

277. (New) The method of claim 265, wherein said information is used to generate a three-dimensional representation of cartilage thickness or a physical model of said normal or said diseased tissue or both.

278. (New) The method of claim 277, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

279. (New) A method of treating a human joint disease involving cartilage comprising:

obtaining CT or MRI image data of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image data to obtain information about geometry of the joint, said electronically evaluating including evaluating said joint along at least two non-parallel planes; and

designing a therapy based on said three dimensional evaluation.

280. (New) The method of claim 279, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional representation of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the initial time,

obtaining a three-dimensional representation of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage evaluated at the later time, and

determining the loss in thickness or regional volume of the region of degenerated

cartilage between the later and initial times.

281. (New) The method of claim 279, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

282. (New) The method of claim 279, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D form D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

283. (New) The method of claim 279, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

284. (New) The method of claim 279, wherein said electronically evaluating further comprises:

providing a biochemically based representation of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

evaluating the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

285. (New) The method of claim 279, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

identifying the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest

between timepoints T_1 and T_2.

286. (New) The method of claim 279, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelctrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

287. (New) The method of claim 184, wherein said electronic data provides information on the thickness, shape, or curvature of said normal and said diseased tissue or the location and size of said diseased tissue.

288. (New) The method of claim 279, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, an implant, a replacement material, a scaffold, a regenerating material, a repair system, tibial corticotomy, femoral osteotomy or tibial osteotomy.

289. (New) The method of claim 279, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent.

290. (New) The method of claim 279, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

291. (New) The method of claim 279, wherein said information is used to generate a three-dimensional representation of cartilage thickness or a physical model of said normal or said diseased tissue or both.

292. (New) The method of claim 291, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

293. (New) A method of treating a human joint disease involving cartilage comprising:

obtaining CT or MRI image data of a joint, wherein said image data includes both normal and diseased cartilage tissue;

electronically evaluating in three dimensions said image data to obtain information about volume, area, thickness, curvature, water content, sodium content, hyaluronic acid content, glycosaminoglycan content, signal intensity or relaxation time of said normal or diseased tissue, or three dimensional geometry of the joint, said electronically evaluating including evaluating said joint along at least two non-parallel planes; and

selecting or designing a therapy based on said three dimensional evaluation.